

REMARKS

Claims 1-36 are pending. Claims 1-5, 8-11, 17-19, 22, 28-29, and 34-36 are rejected. Claims 6-7, 12-16, 20-21, 23-27 are objected to. Claim 28 is amended. Claims 30-33 are allowed. Reconsideration and allowance of Claims 1-36 are respectfully requested.

Allowable Subject Matter

The Examiner has indicated that Claims 30-33 are allowable over the cited references. Applicants thank the Examiner for acknowledging allowable subject matter.

Claim Rejections

Claims 1-5, 8-11, 17-19, 22, 28-29, and 34-36 are rejected under 35 USC §102(e) as being anticipated by U.S. Patent No. 6,237,061 to Srinivasan et al (Srinivasan). Applicants respectfully traverse these rejections.

Claims 1-27

Applicants' Claim 1 recites:

A content addressable memory (CAM) system comprising:

a ternary CAM array segmented into a plurality of array groups, each array group including a plurality of rows of ternary CAM cells; and
a plurality of first storage elements each for storing a priority of a corresponding array group.

First, Srinivasan fails to disclose or suggest a CAM system that includes "a ternary CAM array segmented into a plurality of array groups, each array group including a plurality of rows of ternary CAM cells," as recited in Applicants' Claim 1 (emphasis added).

As discussed in Applicants' previous response of November 22, 2004, Srinivasan discloses in FIG. 4 a single CAM array "group" 200 that includes a plurality of rows of ternary CAM cells 206, where each row of ternary CAM cells 206 includes a number of CAM cells 202 for storing a single CAM word and includes a number of mask cells 204

for storing a local mask word that masks only the single CAM word stored in the corresponding row of ternary CAM cells 206. This is in marked contrast to the CAM system of Applicants' Claim 1, which recites not one but a plurality of array groups each including a plurality of rows of ternary CAM cells.

The Examiner incorrectly equates a "group 202" of Srinivasan's FIG. 6 with an "array group including a plurality of rows of ternary CAM cells" recited in Applicants' Claim 1, and incorrectly asserts that each group 202 of Srinivasan includes a plurality of rows of ternary CAM cells, for example, "disclosed in [Srinivasan's] figure 6 as one of the four rows in each group."

In contrast to the Examiner's assertion, each "group 202" of Srinivasan's FIG. 6 is a single row of ternary CAM cells 206 that includes CAM cells 202 for storing a single CAM word for the row and that includes mask cells 204 for storing a local mask word that masks only the single CAM word stored in the row. For example, referring again to Srinivasan's FIG. 4, Srinivasan teaches a single array or group 200 having a plurality of rows of ternary CAM cells 206, where each ternary CAM cell 206 includes a CAM cell 202 for storing CAM data and a mask cell 204 for storing local mask data (see col. 4, lines 26-34).

More specifically, Srinivasan's FIG. 6 shows a single CAM word stored in each row of CAM cells 202 of Srinivasan's array, and depicts each CAM word as having four segments to illustrate the relationship between the binary values stored in CAM cells 202 and the decimal representation of a corresponding CIDR IPv4/Z address for the row. For example, row index 7 of the illustrative array of Srinivasan's FIG. 6 includes a single row of CAM cells 202 that stores a single CAM word having a binary value of "11010001 01111000 00000000 00000000," which is the binary representation of the corresponding CIDR IPv4 address "209.120.0.0" for the row. Indeed, for clarity, Srinivasan's FIG. 6 depicts the binary value stored in CAM cells 202 of row index 7 as having four segments to illustrate that the first CAM word segment "11010001" is the binary representation of the corresponding first CIDR address portion "209," that the second CAM word segment "01111000" is the binary representation of the corresponding second CIDR address portion "120," that the third CAM word segment "00000000" is the binary representation of the corresponding third CIDR address portion

“0,” and that the fourth CAM word segment “00000000” is the binary representation of the corresponding fourth CIDR address portion “0.”

Thus, row index 7 of Srinivasan's array identifies a single row of CAM cells 202 that stores a single CAM word “11010001 01111000 00000000 00000000” that is the binary representation of a single corresponding CIDR IPv4 address of “209.120.0.0.” Indeed, contrary to the Examiner's assertion, Srinivasan discloses a single CAM array group that includes a plurality of rows of ternary CAM cells. Accordingly, Srinivasan fails to disclose or suggest “a ternary CAM array segmented into a plurality of array groups, each array group including a plurality of rows of ternary CAM cells,” as recited in Applicants' Claim 1.

Second, Srinivasan fails to disclose or suggest a CAM system that includes “a plurality of first storage elements each for storing a priority of a corresponding array group,” as recited in Applicants' Claim 1. The Examiner refers to col. 5, lines 34-55 of Srinivasan to support his assertion that “the groups are prioritized by length of prefix by the index.” Applicants respectfully disagree.

As clearly depicted in FIG. 6 of Srinivasan, each row of Srinivasan's CAM array includes CAM cells 202 for storing a single CAM word and includes mask cells 204 for storing a local mask word that masks only the single CAM word stored in the same row. Thus, contrary to the Examiner's assertion, the local mask word stored in mask cells 204 in a row of Srinivasan's array indicates priority only for the single CAM word stored in the same row of Srinivasan's array (see col. 5, 34-55).

In marked contrast to Srinivasan, Applicants' Claim 1 recites “a plurality of first storage elements each for storing a priority of a corresponding array group.” As discussed above, each of the array groups recited in Applicants' Claim 1 includes a plurality of rows of CAM cells for storing a plurality of CAM words (e.g., which may be different from one another), and thus each storage location recited in Applicants' Claim 1 stores a priority for a plurality of CAM words stored in a corresponding array group. For example, referring to FIG. 13 of Applicants' specification, storage element 1256(0) stores a priority value for corresponding array group 1252(0), where array group 1252(0) includes a plurality of rows of ternary CAM cells for storing a plurality of CAM words (see Applicants' specification at page 37, line 25 to page 38, line 6). Thus, in

marked contrast to Srinivasan, each storage element recited in Applicants' Claim 1 indicates priority for a plurality of CAM words stored in a corresponding array group.

To anticipate a claim under 35 USC §102, each and every element of the claim must be disclosed in a single reference (*Corning Glass Works v. Sumitomo Electric*, 9 USPQ2d 1962, 1965 (Fed. Cir. 1989)). The exclusion of a claimed element, no matter how insubstantial or obvious, from a prior art reference is enough to negate anticipation under 35 USC §102 (*Connell v. Sears, Roebuck & Co.*, 220 USPQ 193, 198 (Fed. Cir. 1983)). Thus, because Srinivasan fails to disclose or suggest a CAM system that includes "a ternary CAM array segmented into a plurality of array groups, each array group including a plurality of rows of ternary CAM cells" and "a plurality of first storage elements each for storing a priority of a corresponding array group," as recited in Applicants' Claim 1, Claim 1 is neither anticipated by nor rendered obvious in view of Srinivasan. Accordingly, Applicants respectfully request the Examiner to withdraw the rejection of Claim 1.

Claims 2-27 depend from Claim 1 and therefore distinguish over the cited references for at least the same reasons as Claim 1.

Claims 28-29 and 34-36

Applicants' Claim 28 (as amended) recites:

A method of operating a content addressable memory (CAM) system including an array of ternary CAM cells segmented into a plurality of array groups, comprising:

storing a plurality of priorities in a plurality of storage elements each associated with one or more of the array groups, wherein each array group includes a plurality of rows of the ternary CAM cells; and

selectively storing data in the array groups according to the priorities.

As discussed above with respect to Claim 1, Srinivasan fails to disclose or suggest a CAM array that is segmented into a plurality of array groups each including a plurality of rows of ternary CAM cells, and also fails to disclose or suggest a plurality of first storage elements each for storing a priority of a corresponding array group that includes a plurality of rows of ternary CAM cells. Rather, as discussed above with

respect to Claim 1, the local mask word stored in a row of Srinivasan's array masks and thereby indicates priority of a single corresponding CAM word stored in the same row. Therefore, Srinivasan fails to disclose or suggest "storing a plurality of priorities in a plurality of storage elements each associated with one or more of the array groups, wherein each array group includes a plurality of rows of the ternary CAM cells," as recited in Applicants' Claim 28. Accordingly, Claim 28 is neither anticipated by nor rendered obvious in view of Srinivasan, and therefore Applicants respectfully request the Examiner to withdraw the rejection of Claim 28.

Claims 29 and 34-39 depend from Claim 28 and therefore distinguish over the cited references for at least the same reasons as Claim 28.

CONCLUSION

In light of the above remarks, it is believed that Claims 1-36 are in condition for allowance and, therefore, a Notice of Allowance of Claims 1-36 is respectfully requested. If the Examiner's next action is other than allowance as requested, the Examiner is requested to call the undersigned at (415) 379-6143.

Respectfully submitted,



Dated: June 2, 2005

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is deposited with the U.S. Postal Service in an envelope addressed to the Commissioner for Patents, Alexandria, VA 22313 on June 2, 2005.



By: _____

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